

ABSTRACT OF THE DISCLOSURE

An apparatus for generating and manipulating a high-pressure fluid jet includes an end effector assembly coupled to a manipulator that imparts motion to the end effector along one or more axes. The end effector assembly includes a cutting head coupled to a source of high-pressure fluid and to a source of abrasive, to generate a high-pressure abrasive fluid jet. A motion assembly is coupled to the cutting head via a clamp positioned around the cutting head. A nozzle body assembly is removably coupled to the cutting head assembly upstream of the orifice. The nozzle body assembly may be separated from the cutting head assembly to allow access to the orifice, without removing the cutting head assembly from the clamp. The clamp has a quick release mechanism, allowing an operator to open the clamp by hand to allow access to the cutting head, and an alignment member is provided on an inner surface of the clamp to accurately locate the cutting head in the clamp. The motion assembly includes two motors coupled together to form a gimbal wrist, each motor having a horizontal axis of rotation. The two axes of rotation are perpendicular to each other, but are not necessarily aligned with the manipulator's axes of motion. Spray from the abrasive fluid jet is contained by a shield provided directly in an end region of the cutting head assembly.